

## MEMORANDUM

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Date: November 20, 2020 Project #: 23021.027  
To: Mary Brazell (ODOT)  
From: Wayne Kittelson  
Project: Transportation Electrification Infrastructure Needs Analysis (TEINA)  
Subject: November 17 TEINA Advisory Group Meeting #1

### **MEETING SUMMARY**

#### **Welcome and Introductions (Amanda Pietz and Stacy Thomas)**

- Transportation Electrification Infrastructure Needs Analysis (TEINA) Study is being completed to comply with the 2020 Governors Order on Climate (Executive Order 20-04)
- Focus on the gaps for transportation electrification infrastructure and charging in particular
- The Advisory Group was formed to:
  - Ensure consideration of diverse locations and populations
  - Provide diverse perspectives from utilities, local governments, non-profits, and other organizations
- The agenda for the meeting was reviewed
- Navigation of the WebEx platform was explained
- Members of the public were asked to wait to submit their comments until the specified time in the agenda
- Advisory Group members introduced themselves and the organization they represent
- Project Team members introduced themselves All attendees were asked to sign in with their name in the chat box and identify if they planned to make a public comment

#### **Project Overview (Mary Brazell)**

- In Oregon, transportation accounts for about 40% of greenhouse gas emissions, with light duty trucks and cars accounting for about half of the transportation emissions
- To reduce greenhouse gas emissions, light duty cars and trucks will need to be fueled by electricity as will other modes of transportation
- 2019 Senate Bill 1044 set zero emission vehicle (ZEV) targets for light duty cars and trucks
- Convenient, accessible, and reliable charging infrastructure is critical to adoption of ZEV
- Executive Order 20-04 directed ODOT to lead a TEINA study to look at charging infrastructure needs statewide
  - The focus is on light duty charging, however all use cases will be considered
  - Rural areas and disadvantaged and underserved communities will receive special attention
  - The TEINA analysis is due on June 30, 2021
  - The study will focus on on-road vehicles
- The Study will:
  - Create a vision for the charging infrastructure needed to meet the statewide transportation goals of Oregon,

- Position the State to pursue a strategic implementation plan
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- Review existing conditions
  - The Advisory Group and public were asked to provide any studies or data regarding charging infrastructure (usage, install date, future projections, etc.)
- Develop demand scenarios for charging infrastructure by evaluating the needs of nine specific drivers and use cases, through stakeholder listening sessions.
- Assess future trends and develop three scenarios for adoption of electric vehicles in 2025, 2030, and 2035. These scenarios will be discussed in the Advisory Group meeting in January.
- The Study will not identify specific locations for charging infrastructure and will not address barriers to electrification other than charging infrastructure. Policy options and investment actions will be discussed in the Advisory Group meeting in March. A draft of the study will be discussed in the Advisory Group meeting in May.
  - A supplemental effort will be conducted to consider infrastructure needed to provide fueling for Hydrogen vehicles.
- Stakeholder engagement strategies
  - The purpose of stakeholder engagement is to ensure that all Oregonians are supported by ZEV charging infrastructure and the evolution of other transportation options
  - Engagement will include the Advisory Group and 12 stakeholder groups
  - Stakeholder emails will be sent out throughout the study
  - Fact sheets will be posted on the project website throughout the study
- The goal is to develop a plan for focusing investment and programs to achieve overall program goals
- Comment from Ken Dragoon: Will TEINA consider Hydrogen fueling or will there be a follow-up effort? *Response:* The study will look at Hydrogen, however it will be focused on the elements from the Executive Order.
- Comment from Vee Paykar: Will stakeholders be provided with a stipend? *Response:* The Every Mile Counts program is holding a workshop in December to discuss this more broadly.

#### **Advisory Group Overview (Amanda Pietz)**

- The Advisory Group will receive materials a week before meetings
- The roles, responsibilities, and meeting guidelines are provided on the TEINA study website
- Preferred for the Advisory Group to review materials ahead of time
- Provide an opportunity for all Group members to share perspectives
- Direct any media inquiries to ODOT
- The intention of the group is to be advisory and inform the progression of the study
- Review of the next Advisory Group meeting dates
- There may be some work extending beyond June

#### **Electric Vehicle Charging in Oregon Snapshot (Wayne Kittelson, Lynn Daniels, Shenshen Li, and Chris Nelder)**

- A high-level overview of Oregon's Electric Vehicle (EV) Landscape
  - Oregon has a robust program with collaboration across the Western states, nation, and world
  - Several state, local, and transit agencies have initiatives underway
  - Other organizations have ongoing work as well

- Seven barriers have been identified to Transportation Electrification (TE) that need to be addressed, including four at the state level (awareness, cost, infrastructure, and equity) and three at the national level (including product, interoperability, and reliability). Infrastructure is the focus of TEINA study.
- Key electrification corridors in Oregon include I-5, I-84, US 101, US 97, and US 26.
- The funding for Light Duty Vehicle (LDV) electrification infrastructure was catalogued and is approximately \$20 million.
  - About 55% of this is from utility funding and 45% is from state agencies.
  - A majority of the funding is dedicated to urban areas. Very little funding is being invested in rural areas.
- Advisory Group members were interviewed to identify what they would like to see from the TEINA study:
  - Study recommendations must be actionable, with steps
  - Identify who needs to do what (roles and responsibilities)
  - Recognize diversity of Oregon (particularly urban / rural)
  - Energy costs impact private investment (need to yield profit) otherwise reliance on public funding. Especially in areas of lower utilization public funding will be critical.
  - Investment is currently focused on a few use cases, need to explore other use cases
  - Infrastructure is a driver of adoption (don't just meet needs of today)
  - Infrastructure needs to be maintained
  - The Clean Fuels Program is important and lifeline for EV adoption in rural areas
  - Financial benefits need to be highlighted to certain communities
- Existing conditions
  - Most ZEVs are registered around Portland. Large growth trends in recent years
  - Existing charging locations are located along major corridors, with a high density of chargers around Portland
  - 3 types of chargers (Level 1, Level 2, DC Fast Chargers or DCFC's) are available. Level 1 is the slowest, DCFC is the fastest charging. A majority of the chargers are Level 2.
  - There are 14 ZEVs per plug (some charging locations have multiple plugs) across Oregon
- Three scenarios will help determine ZEV adoption trends. The team plans to focus scenarios on the economic effects of COVID. In each scenario, the adoption targets set by legislation will be met in 2035. The scenarios to discuss during the breakout sessions include:
  - Scenario 1, Base Case: Trends from before COVID
  - Scenario 2, Rapid Return to Normal: Economy remains depressed through 2022, before having a fast return to former trends.
  - Scenario 3, Slow Recovery: Economy remains depressed through 2025, before rapidly recovering.

### Small Group Break Out Sessions

- The AG members were broken into four groups to discuss proposed scenarios
- Breakout session notes are included in the Appendices A-D
- Summary of the reports delivered by each group:
  - Question 1: Do the presented scenarios make sense? Are they realistic?
    - Group 1: Reasonable to consider COVID, however investment in EV infrastructure needs to continue.
    - Group 2: Scenario 1 is unrealistic, Scenario 2 and 3 seem to be more reasonable. Vehicle ownership and ability to purchase EV has not been as affected by COVID.

Level 2 charging is a good solution for rural, however in urban areas DCFC may serve multi-family well.

- Group 3: Considered if COVID is the right driving factor? The economy is key to determining the ramp up of ZEVs. There are number of variables that will impact: technology, political landscape (funding), regulations.
- Group 4: The scenarios sound reasonable, the impact of COVID on behaviors is still difficult to predict. It is important to have a spectrum of scenarios.
- Question 2: Are the presented scenarios helpful? Will they help guide government and other stakeholders to understand the real challenges and options they will face over the next 15 years as they try to meet SB 1044 targets?
  - Group 1: Business models are still developing. Private companies are stepping up, however utilities and state need to also provide policy structure.
  - Group 2: Utilities need to think about a regional investment approach, outside of traditional service territory. Municipalities need to consider a complete policy for infrastructure, combined with incentives from utilities. Consider the use of Clean Fuels money to address regional/county-wide needs.
  - Group 3: Utilities are a big player, there is a nexus of utilities working with state agencies, especially to invest in areas where there is lower demand.
  - Group 4: A missing stakeholder is traditional gas companies. All entities have a role to play, make sure that regulations make sense. Haven't seen a lot of investment from manufacturers (except Tesla) in infrastructure. For private investment, profitability is critical. The government can help streamline regulatory practices and provide consistent information to all stakeholders.

#### **Public Comment**

- Notes on all submitted public comments are included in Appendix E.

#### **Next Steps** (Amanda Pietz)

- Finalize existing conditions and understand what actions are currently underway
- Complete stakeholder listening sessions to understand interests, needs, concerns, and challenges
- Meeting materials are included on the project website
- Review of dates for upcoming Advisory Group meetings

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## **MEETING PARTICIPANTS**

### **Project Team Members**

Mary Brazell (ODOT Climate Office and TE Program Manager)  
Zechariah Heck (ODOT Climate Office)  
Jessica Reichers (ODOE and Policy Team Manager)  
Wayne Kittelson (Kittelson & Associates)  
Stacy Thomas (HDR)  
Alexander Nelson (HDR)  
Chris Nelder (Rocky Mountain Institute)  
Lynn Daniels (Rocky Mountain Institute)  
Britta Gross (Rocky Mountain Institute)  
Shenshen Li (Rocky Mountain Institute)  
Rhett Lawrence (Forth)

### **Advisory Group Members Present**

Amanda Pietz, Director, ODOT Climate Office  
Greg Alderson, PGE, he  
Tom Ashley, Greenlots, he/him  
Phil Barnhart, EVEVA  
Chris Chandler, Central Lincoln PUD  
Marie Dodds, AAA Oregon, she/her  
Judge Liz Farrar, Gilliam County, she/her  
Ingrid Fish, City of Portland, she/her/hers  
Alan Bates, City of Portland  
Stu Green, City of Ashland  
Jamie Hall, GM, he/him  
Zach Henkin, Cadeo, he/him  
Joe Hull, Midstate Electric Co-op, he/his  
Juan J Serpa Muñoz, EWEB, he/him  
Vee Paykar, Climate Solutions  
Cory Scott, Pacific Power, he/him  
Ron Rasmussen, OTEC, he/him  
Dexter Turner, OpConnect

### **Other Attendees**

Megan Green, Umatilla County, she/her  
Patrick Brennan, Legislative Policy and Research Office  
Jennifer Joly, OR Municipal Utilities Association, she/her  
Don Hamilton, ODOT, he/him  
Tom McBartlett, City of Ashland Electric Utility  
Tiffany Edwards, Lane Transit District  
Rob Currier, Emerald PUD, he/him  
Nicole Blackwell, Idaho Power, she/her  
Daniel Frye, OLCV MCAT, he/him  
Ryan Perry, Tillamook PUD  
Tomas Endicott, Bonneville Environmental Foundation, he/him  
Cory-Ann Wind, Oregon DEQ, Oregon Clean Fuels Program, she/her  
Eric Smith, SemaConnect

Kristin Evered, Washington State Pollution Liability Insurance Agency, she/her  
Michael Breish, WA Dept. of Commerce  
Ryan Levandowski, Georgetown Climate Center, he/him  
Ken Dragoon, Renewable Hydrogen Alliance, he/him  
Stephanie Palmer, CARB, she/her  
Thomas Elzinga, Consumers Power, Inc.  
Elise Keddle, California Air Resources Board, she/her  
Annabel Drayton, NW Energy Coalition, she/her  
Rachel Sakata, Oregon DEQ  
Michael Graham, Clean Cities, he/him/his  
Patti Best, Idaho Power, she/her

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## ATTACHMENT A: Notes from AG Breakout Group #1

Note Taker: Stacy Thomas  
Facilitator: Mary Brazell

Participants: Jamie Hall  
Greg Alderson  
Zach Henkin  
Ron Rasmussen

### Summary

- Other variables in addition to COVID should be considered. COVID is not expected to change the overall electrification trend.
- Infrastructure investment and policy change should continue, regardless of economic scenario or COVID situation.
- All stakeholders need to be making investments in charging infrastructure.
- Consider a study on the “business of charging”. The government has an especially important role if the business case is not clear, for example in non-urban areas.
- Need to understand what investments have the greatest cost effectiveness.

### **Question 1 (Scenarios):**

- Jamie input summary
  - The bookends are good for the scenarios.
  - There are other variables to consider in addition to COVID
  - The value proposition needs to make sense, getting closer now but cost is still an issue
  - How can we make electric feasible for most people?
  - There is no silver bullet for multi-dwelling residents
- Greg input summary
  - Reasonable to include COVID
  - We need to determine the how, what, and where of infrastructure needs
  - Need to make clear that COVID is not expected to be a sea change in the overall electrification trend and it is only a delay
  - We don’t want to inadvertently slow things down – for example, due to study analysis, “oh, we won’t do investments no because the study says there is a slow down until 2025.” Need to put into context.
- Zach input summary
  - Agrees that context is so important. Need to thoughtfully put in context to use productively. Don’t want misinterpretation – which can go many ways. For example:
    - “We can halt policy due to the delay in uptick due to COVID.” OR
    - “If there is an uptick, we can stop incentives.”

- To achieve success we need to continue new programs, new incentives, etc.
- There may be some frustration with supply chain issues – people wanting vehicles but unable to get in a timely manner.
- Ron input summary (alternate for Charlie)
  - In eastern Oregon, not much adoption. It is a big gap currently. EV adoption will come, but it is delayed. Discussion about DC chargers in Burns and other locations. Need to push ahead.

## Question 2

### Jamie input summary

- “All of the above” need to be making the investments.
- Mentioned their partnership with EVGO
- Gap is so big, there is a long way to go
- Need to get to the point where there are investments across the board and not relying on automakers putting in infrastructure to build sales
- Strong role for utilities and county/state/federal agencies
- Need to ID what sorts of investment has most bang for the buck

### Greg input summary

- Agree with all of Jamie’s input.
- There is a role for government agencies where the business case is not clear
- Utilities have a number of roles - in all cases of investment
- Need proactive and good planning to accelerate adoption, more effective charging rebates, installing chargers, readying infrastructure
- Referenced I-5 study that looks at system needs re: charging

### Zach input summary

- We should consider TE investments for HD and MD and that will benefit LD vehicles.
- Need more thought for the business model of charging.
- Where are new pots of money?
- Earning a return on charging only occurs in urban areas – need a study on the “business on charging”



## **ATTACHMENT B: Notes from AG Breakout Group #2**

Note Taker: Lynn Daniels  
Facilitator: Zechariah Heck

Participants: Tom Ashley  
Ingrid Fish  
Juan Serpa Muñoz  
Chris Chandler

### **Summary**

- Scenario 2 is the most reasonable, although it is valuable to see different scenarios.
- Other considerations include the roles of transit agencies, Uber, and Lyft.
- COVID may not have impacted those interested in buying ZEVs as much as the population overall. Lower income and communities of color have been most affected by COVID.
- Consider access to ZEVs in addition to ZEV ownership.
- DCFC charging is important for use cases including ride hailing, multi-unit dwellings, and in urban contexts.

Tom: important to account COVID situations

- Scenario 3 seems to aggressive and Scenario 1 is not realistic
- We will likely see a shift in orgs approach to transportation; OEMs will be making vehicles... However, COVID has a lot of economic fallout which is biggest impact... Individuals that were not as impacted convert to ZEVs? Those that have been impacted will need assistance.
- Scenario 2 is most likely, but needs some reworking

Ingrid:

- Scenario 1 is unrealistic; 2 or 3 is more realistic(hard to determine which one)
- City of PDX is focused on reducing VMT – walk, bike OK
  - Increase EVs to transportation deserts
  - COVID has impacted transit ridership and thus routes
  - Uber and Lyft have big impact in urban areas and tied to COVID

Juan:

- Scenario 2 is most important
- Pandemics may become more likely, important to consider this is not one-time event.
- Transit is really important because COVID has impacted typical rider the most
- COVID has not impacted those interested in buying new ZEVs as much
- Focus needs to be on communities not able to buy ZEVs... two different markets – access to ZEVs not necessarily ownership.

Chris:

- # of charging sites need to be specified on type
- Data exists to inform scenarios
- Recreational vehicles are rapidly increased – how do we electrify vehicles that are increasing in usage due to COVID
- Need for charging needs to be relevant to L2
- Gas station prism – does not relate (L3 is for visitors?)
  - Juan acknowledged L3 is important for ride hailing, MUD tenants, etc. Ingrid – in urban context L3 is really important.

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## **ATTACHMENT C:**

### **Notes from AG Breakout Group #3**

Note Taker: Chris Nelder  
Facilitator: Amanda Pietz

Participants: Phill Barnhart  
Joe Hull  
Vee Paykar  
Cory Scott

#### **Summary**

- Many variables will impact adoption rates, including but not limited to COVID. Understanding a range of scenarios is helpful.
- Regardless of the ongoing economic situation, infrastructure investment is critical to driving adoption of EVs.
- Collaboration between government, utilities, manufacturers, and communities is critical to provide access to all.
- Policies and programs must consider a regional/multi-disciplinary perspective, sometimes beyond the traditional service area of stakeholders.
- Variables other than COVID should be considered, including policies, battery cost, diversity of vehicle models, and number of locations with policies. Consider using a 'base', 'slow', and 'fast' set of scenarios.
- Co-ops must consider how to best serve members, who may not be solely benefiting from local charging infrastructure. Serving members in low utilization areas may be difficult.
- Important to understand when and where adoption will occur.
- Charging infrastructure must be provided, so people will choose to purchase a ZEV.

#### **Response to scenarios**

Phil: Not sure that basing scenarios around Covid makes sense. One variable among others. While auto sales are down a lot that's not true for EVs, where sales are still strong. EVs are cannibalizing ICE.

Cory: Is Covid the variable to focus on? New administration, battery cost trends, etc. are all important variables. Prefers to see a standard base case, slow, fast scenarios.

Phil: Proliferation of new models is also important...we're going to be getting BEV pickups, lots of new models from VW, heavy trucks from Daimler. Lack of models for specific use-cases has been a barrier, that will fall.

Vee: Thinks Covid is an important variable, but maybe not the base variable. Still would be very interested to see what the scenarios would look like with that taken into account.

Amanda: Thinking about the “tipping point” if there are enough places putting policies into place.

Phil: Would not surprise him if OR adopted the CA goals for 2035.

Joe: As a rural utility, our tipping points lag behind...EE, net metering, etc. Thinks Covid could still be an important thing to look at. We spend our members’ money...if recovery is slow, there would be pushback against spending on EV infrastructure.

Phil: Really depends on what the local economy consists of...where Joe is in mid-state, very dependent on tourism, which would be the last to recover, so would be very affected by a slow recovery. Also most EVs are adopted by the top 25% of income which is concentrated in urban areas. Urban/rural economies will behave differently and recover differently.

### **Response to charging infrastructure question**

Joe: Co-ops are unique. We serve like 90 miles of the (?) corridor. If we play a role in deploying chargers in say Chemult, would that serve our members, or people just driving through our territory? How do we best serve our membership? Since we are rural, we have a lot of locations where the need is definite but utilization will be low. Kind of a tough spot.

Phil: Financing is a key question. The IOUs can rate-base this stuff but in other places maybe subsidies will be needed to build, then let co-ops pay for maintenance or whatever. Small co-ops should not be subsidizing through drivers.

Cory: On timing...the issue that Joe raised is largely about when. And adoption curves. How many cars where and when, and what are the benefits? This study needs to help us understand that. Utilities need to play a critical role, but when and how are key questions.

Vee: Current problem is that people who don’t have chargers around will never buy an EV, e.g., MUD dwellers. Or EVSPs may offer charging at costs that are unaffordable. Need to promote ZEV adoption from the infrastructure side.

Cory: Agree with Vee. Can’t wait for others to act. Rural equity is important and utilities have an important role to play.

Phil: On timing...if we build an apartment building now, it will be there for 100 years, need to have building codes in place now.

Amanda: How can different players serve different niches? What’s ODOT’s role in getting charging infra built where private sector EVSPs wouldn’t build it?

Phil: Have a consortium in Eugene area trying to get Electrify America to certify us as metro area they could build in. Automakers have a big role and they’re not fulfilling it other than Tesla which is walled off.

Joe: We're currently evaluating what's going on in our territory, we kind of know how many EVs we have and where they are, launching a new website, asking members what we need to do. Workplace, possible rebates for home charging. We don't know what we don't know.

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## **ATTACHMENT D: Notes from AG Breakout Group #4**

Note Taker: Wayne Kittelson

Facilitator: Jessica Reichers

Participants: Marie Dodds  
Judge Liz Farrar  
Stu Green  
Britta Gross  
Dexter Turner

### **Summary**

- Home charging may cover the needs of the vast majority of EV owners. There is a perception that we need more infrastructure than is actually the real need. However, in rural areas long distance trips may not permit the sole use of home charging.
- How can access be provided to all?
- How can we make the existing infrastructure more useful?
- Traditional gas station companies will play an important role.
- Utility companies are focused on light duty vehicles. Interstate and multi-use dwelling charging needs are not being addressed.

### **QUESTION 1: Do the proposed scenarios make sense?**

Marie Dodds – The proposed scenarios seem reasonable to her

Stu Green – Agrees with Marie – no one has a crystal ball; COVID is shifting the way we do things but not stopping

Britta Gross – Important to remember that all three scenarios will lead to achieving the 2035 targets

Jessica Reichers – The goals don't change and what's needed doesn't change – policy options is where we'll need to be focused (Britta Gross added that these policy options should be funding-related)

- For example – what's our tolerance for underutilized and/or obsolete equipment in the field?
- The things that will need to be accomplished will probably need to be front-loaded into the first half of each of the proposed scenarios.

Marie Dodds – We are seeing the range of EV's extending dramatically with the new models that are being introduced.

- Home installations will most likely cover the charging needs for the vast majority of EV owners.
- Over time, publicly-accessible infrastructure may not be as necessary as it is today.

Britta Gross – The perception is that we need more infrastructure than the real need actually is.

Liz Farrar – Maries comments are applicable in urban areas but not so much in the rural parts of the state, where it is typical to take a 70-mile one-way trip just to get to a grocery store.

## **QUESTION 2: Will the scenarios be helpful?**

Stu Green – absolutely:

- Prepares for a range of likely options
- Question to be answered: What do we need to do in order to provide access to all?
- Question to be answered: How can we make our current (existing) infrastructure more useful?
- E-bike adoption is occurring rapidly and may actually slow down EV adoption rates. Even so, Stu believes that once people go down the electric route they will likely stay with the electric option.
- COVID is affecting the funding options that are available so it's the right way to go.

Britta Gross – Out of necessity we will need to leverage the existing system, particularly since the future infrastructure needs are likely to be astronomical

Jessica Reichers – If the infrastructure does not exist then we will lose EV drivers

- She believes the scenarios are reasonable

## **QUESTION 3: Who's going to build the charging infrastructure?**

Dexter Turner – Traditional gas station companies will likely play an important role

- Some are already piloting this
- They may run into regulatory problems/delays as well as challenges associating with mixing high voltage electricity with volatile gasoline and other fossil fuels.

Jessica Reichers – Perhaps they should be working in concert with some of the EVSE's?

Britta Gross – They (gas station companies) may have their own strategies to follow that are different from the EVSE strategies

Dexter Turner – On the business side, all will face unique challenges

- CA is dealing with finding the right mix of weight/measure funding regulations that work for EV's and also fossil fuels.

Marie Dodds – Will likely be a combination of all of the above – everybody has a stake and everybody has a role to play

Britta Gross – Doesn't see any real involvement from OEM's other than Tesla.

Stu Green – Utilities currently have their focus on LDV's right now; interstate charging needs are not necessarily being addressed, nor are the MUD charging needs

## ATTACHMENT E: Public Comments

- **Comment from Ken Dragoon:** ZEV should include fuel cell vehicles. Hydrogen is sourced through electricity. There may be a significant use cases in rural areas. Hydrogen vehicles will grow in importance as surplus energy from renewable sources is increased.
- **Comment from Sam Ko:** Rest stops along freeways should have fast charging capabilities. Motels and hotels should have multiple fast charging ports including Level 2. Worksites with more than 50 employees should have fast charging. Apartment complexes should have at least Level 2 fast charging.
- **Comment from Captain Peter Wilcox:** He is on the engineering team for Frog Ferry, a commuter passenger ferry service based in the Portland metro area, with stops from Vancouver to Oregon City. Ideally, they would like to have a full fleet of electric propulsion boats. Encourage ODOT to consider shore side charging infrastructure for the fleet.